



NASA SBIR 2007 Phase I Solicitation

X7.04 Surface System Dust Mitigation

Lead Center: GRC

Participating Center(s): ARC, GSFC, JPL, JSC, KSC, LaRC, MSFC

The general objective of the subtopic is to provide knowledge and technologies (to Technology Readiness Level (TRL) 6 development level) required to address adverse dust effects to exploration surface systems and equipment, which will reduce life cycle cost and risk, and will increase the probability of sustainable and successful lunar missions. The subtopic will help to develop a balance of near- and long-term knowledge and technology development, driven by Exploration Systems Mission Directorate needs and schedule requirements, aligned with existing technology investments where possible. The technical scope of the subtopic includes the evaluation of lunar dust effects and development of mitigation strategies and technologies related to Exploration Surface Systems, such as: Rovers and Robotic Systems, In Situ Resource Utilization (ISRU) Systems, Power Systems, Communication Systems, Airlock Systems and Seals, Habitats, and Science Experiments.

The subtopic specifically requests technologies addressing dynamic mechanical systems used for lunar surface missions with potential to mitigate effects of lunar dust. For lubricated mechanisms, such as drives and pointing mechanisms, the sealing element must be durable enough to maintain a hermetic seal to prevent lubricant out gassing and dust contamination for at least 5 years. Also, the bearings, gears, etc. of the mechanism must be robust enough to survive and provide nominal operation with lunar dust contamination and possible lubrication starvation.

The subtopic also requests proposals for advanced materials, coatings, and related technologies with the proper combination of physical, mechanical, and electrical properties, and lunar environmental durability, suitable for use in dust mitigation applications on the lunar surface.